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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/024,582	12/21/2001	Dong Ho Kang	041501-5484	2488
9629	7590	12/24/2003	EXAMINER	
MORGAN LEWIS & BOCKIUS LLP 1111 PENNSYLVANIA AVENUE NW WASHINGTON, DC 20004			NGO, HUYEN LE	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 12/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.



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MORGAN, LEWIS & BOCKIUS LLP
1800 M Street, N.W.
Washington, DC 20036

EXAMINER

NGO, HUYEN LE

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Office Action Summary

Application No.

10/024,582

Applicant(s)

KANG ET AL.

Examiner

Julie-Huyen L. Ngo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☒ Claim(s) 5-8 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____. | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following features recited in claims 5 and 8 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

- “each of the plurality of column spacers having a round shape at a upper portion and corresponding to two pixel electrodes,” as recited in lines 6-8 of claim 5.
- “the contact area having a plurality of curves,” as recited in lines 2-3 of claim 8.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The abstract of the disclosure is objected to because it not clearly states which is new in the art to which the invention pertains. Particularly the location of the round shape since it is unclear of where considered to be “**the upper portion**” of the spacer. See MPEP § 608.01(b). Correction is required.

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The specification is objected to as failing to provide sufficient description of where considered to be the **“the upper portion”** of the spacer.

The specification is objected to as failing to provide sufficient and proper antecedent basis for the claimed subject matter recited in claims 5 and 8. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

The specification fails to provide sufficient description of how to make *“each of the plurality of column spacers having a round shape at a upper portion and corresponding to two pixel electrodes.”* as recited in lines 6-8 of claim 5.

The specification fails to provide sufficient description of how to form *“the contact area having a plurality of curves.”* as recited in lines 2-3 of claim 8.

Claim Objections

Claims 1-8 are objected to because of the term “upper portion” used to describe the portion of the spacers in claims 1 and 5.

It is unclear from the recitation of the claims which portion is considered to be the **“upper portion”** of the spacer and how that portion is positioned in reference to the substrate, and also which substrate since there could be either the TFT or color filter substrate as recited in claim 1.

Claim 4 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper

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dependent form, or rewrite the claim(s) in independent form. It appears that claim 4 should be depended from either claims 2 or 1.

All claims that are depended from the above-mentioned claims and are not specifically discussed above are objected as bearing the defects of the claims from which they depend.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 5-8 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 5 recites "*each of the plurality of column spacers having a round shape at a upper portion and corresponding to two pixel electrodes*," in lines 6-8, which was not described in the specification in such a way as to enable one skilled in the art to make and/or use the invention.

A similar problem as set forth above in claim 5 exists in claim 8 regarding "*the contact area having a plurality of curves*," as recited in lines 2-3.

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All claims that are depended from the above-rejected claims and are not specifically discussed above are rejected as bearing the defects of the claims from which they depend.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyazaki et al (US 5978061).

Miyazaki et al. disclose (col. 15, lines to col. 16, line 17; figs. 19-21) a Liquid Crystal Display (LCD) device comprising:

With respect to claim 1,

- a TFT substrate 10 including a plurality of pixels of R, G, and B;
- a color filter substrate 30 that is spaced apart from the TFT substrate;
- a plurality of column spacers 33 selectively formed on the TFT substrate or on the color filter substrate (co. 16, lines 8-17), the column spacers having a round shape at an upper portion; and
- a liquid crystal layer 40 injected between the TFT substrate and the color filter substrate.

With respect to claim 2,

- one column spacer is provided for every two pixels (fig. 20)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al. as applied to claim 1 above, and further in view of Hasegawa et al. (US 5499128).

With respect to claim 3, Hasegawa et al. teach (col. 23, lines 35-60 and fig. 11) forming a column spacer 112c having a contact area contacting the substrate, the contact area with a semispherical shape recessed portion 143 for having the liquid crystal positioned within the recessed portion serves to scatter the light. Doing so would allow the light leakage around the spacer portion be markedly suppressed during operation under the normally black mode, leading to a marked improvement in the display quality of the liquid crystal display device (col. 23, lines 52-60).

Therefore, it would have been obvious for one of ordinary skill in the art to form the spacers in Miyazaki et al. LCD device with each spacer contacting a color filter substrate and having a semispherical shape for having the liquid crystal positioned within the semispherical shape serves to scatter the light, and for suppressing the light leakage around the spacers to improve the display quality of Miyazaki et al. LCD, as taught by Hasegawa et al.

With respect to claim 4, Hasegawa et al teach (col. 24, line 25-65 and figs 14a-14C) forming a plurality of column spacers 112 each having contact area with a square shape with at least one protrusion among four sides for suppressing the light leakage around the columnar spacers, leading to a satisfactory picture image displayed on the screen.

Therefore, it would have been obvious for one of ordinary skill in the art to form the spacers in Miyazaki et al. device with each spacer having contact area with a square shape with at least one protrusion among four sides for suppressing the light leakage around the columnar spacers, leading to a satisfactory picture image displayed on the screen, as taught by Hasegawa et al.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kishimoto et al (US 6396559 B1) disclose a LCD including spherical spacers used in combination with polymer walls.

Morii (US 6335779 B1) discloses a liquid crystal display apparatus and method for producing TFT using primary spacers having spherical shape, and secondary spacers having columnar shape.

Nishiguchi (US 6226067 B1) disclose a liquid crystal device having spacers and manufacturing method thereof.

Swirbel et al. (US 5328728 A) disclose a process for manufacturing liquid crystal device substrates having a plurality of semispherical shape spacers (35).

Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Julie-Huyen L. Ngo whose telephone number is (703) 305-3508. The Examiner can normally be reached on T-Friday.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's Supervisor, Mr. Robert H. Kim can be reached at (703) 305-3492.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

June 24, 2003



Julie-Huyen L. Ngo
Patent Examiner
Art Unit 2871